

# 1. TRAPA Linnaeus, Sp. Pl. 1: 120. 1753.

菱属 ling shu

Morphological characters and geographic distribution are the same as those of the family.

Numerous species and infraspecific taxa have been proposed based on variations in size and ornamentation of the fruit. However, these variations overlap to such an extent that a more discrete definition of taxa is not supported here.

Plants are regionally cultivated for their fruit, which contain abundant starch and are consumed both raw and cooked. The seeds are ground into a flour used for medicine and making starch and wine. The fruit and fresh plants can be used for pig feed.

- 1a. Plants small; stem 1–2.5 mm in diam.; leaves alternate, terminal rosette loose, if present, leaf blade rhombic-triangular, 1.5–3 × 2–4 cm, straight lateral edges forming near right angles at mid-blade, margin incised dentate; fruit narrowly rhombic, 4-horned, horns conic, tapering to a sharp point ..... 1. *T. incisa*
- 1b. Plants stout; stem 2.5–6 mm in diam.; leaves in terminal rosettes, leaf blade deltoid-rhombic, 4–6 × 4–8 cm, lateral edges rounded, margin variously dentate; fruit variously turbinate to shortly rhombic, (0–)2–4-horned, horns variously triangular to conic, base thickened, apex blunt to sharp, or some horns reduced to a process ..... 2. *T. natans*

**1. *Trapa incisa*** Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4: 134. 1845.

细果野菱 xi guo ye ling

*Trapa bispinosa* Roxburgh var. *incisa* (Siebold & Zuccarini) Franchet & Savatier; *T. incisa* var. *quadricaudata* Glück; *T. maximowiczii* Korshinsky; *T. maximowiczii* var. *tonkinensis* Gagnepain; *T. natans* Linnaeus var. *incisa* (Siebold & Zuccarini) Makino.

Stem 1–2.5 mm in diam. Petiole 5–15 cm, slender, slightly swollen distally or not; leaf blade glossy and dark green adaxially, green or sometimes purplish abaxially, often black-brown or with 2 dark spots basally, rhombic-triangular, 1.5–3 × 2–4 cm, glabrous or sparsely pubescent on veins, adaxially glabrous, base broadly cuneate, margin coarsely and sharply incised-dentate distally. Petals pink to pale purplish or white, 5–7 mm. Fruit narrowly rhombic, 0.8–1.5 × 1.2–2 × 0.7–1 cm, 4-horned, surface variously ribbed to smooth, crest absent, crown dome-shaped to inconspicuous, 1–3 mm, beak finely conic; horns conic, 1–1.5 cm, unequal, lower horns descending, upper horns horizontal to ascending, apex barbellate. Fl. May–Oct, fr. Jul–Nov.  $2n = 48, 88^*, 90^*, 92^*, ?96$ .

Swamps, ponds; near sea level to 1000 m, to 2000 m in SW China. Anhui, Fujian, Guangdong, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Laos, Malaysia, Russia (Far East), Thailand, Vietnam].

**2. *Trapa natans*** Linnaeus, Sp. Pl. 1: 120. 1753.

欧菱 ou ling

*Trapa acornis* Nakano; *T. amurensis* Flerow; *T. amurensis* var. *komarovii* Skvortsov; *T. arcuata* S. H. Li & Y. L. Chang; *T. bicornis* Osbeck; *T. bicornis* var. *acornis* (Nakano) Z. T. Xiong; *T. bicornis* var. *bispinosa* (Roxburgh) Nakano; *T. bicornis* var. *cochinchinensis* (Loureiro) Steenis; *T. bicornis* var. *quadrispinosa* (Roxburgh) Z. T. Xiong; *T. bicornis* var. *taiwanensis* (Nakai) Z. T. Xiong; *T. bispinosa* Roxburgh; *T. bispinosa* var. *iinumae* Nakano; *T. chinensis* Loureiro; *T. cochinchinensis* Loureiro; *T. dimorphocarpa* Z. S. Diao; *T. japonica* Flerow; *T. japonica* var. *jeholensis* (Nakai) Kitagawa; *T. japonica* var. *longicollum* Z. T. Xiong; *T. japonica* var. *mag-*

*nicorona* Z. T. Xiong; *T. japonica* var. *tuberculifera* (V. N. Vassiljev) Tzvelev; *T. jeholensis* Nakai; *T. korshinskyi* V. N. Vassiljev; *T. litwinowii* V. N. Vassiljev; *T. litwinowii* var. *chi-huensis* S. F. Guan & Q. Lang; *T. manshurica* Flerow; *T. manshurica* var. *bispinosa* Flerow; *T. manshurica* f. *komarovii* (Skvortsov) S. H. Li & Y. L. Chang; *T. natans* var. *amurensis* (Flerow) Komarov; *T. natans* var. *bicornis* (Osbeck) Makino; *T. natans* var. *bispinosa* (Roxburgh) Makino; *T. natans* var. *japonica* Nakai; *T. natans* var. *pumila* Nakano ex Verdcourt; *T. natans* f. *quadrispinosa* (Roxburgh) Makino; *T. natans* var. *quadrispinosa* (Roxburgh) Makino; *T. potaninii* V. N. Vassiljev; *T. pseudoincisa* Nakai; *T. pseudoincisa* var. *aspinosa* Z. T. Xiong [“*aspinfa*”]; *T. pseudoincisa* var. *complanata* Z. T. Xiong;

TRAPACEAE

*T. pseudoincisa* var. *nanchangensis* W. H. Wan; *T. pseudoincisa* var. *potaninii* (V. N. Vassiljev) Tzvelev; *T. quadrispinosa* Roxburgh; *T. quadrispinosa* var. *yongxiuensis* W. H. Wan; *T. saissanica* (Flerow) V. N. Vassiljev; *T. sibirica* Flerow; *T. sibirica* var. *saissanica* Flerow; *T. sibirica* var. *ussuriensis* Flerow; *T. taiwanensis* Nakai; *T. transschelii* V. N. Vassiljev; *T. tuberculifera* V. N. Vassiljev.

Stem 2.5–6 mm in diam. Petiole (2–)5–18 cm, stout, ± swollen distally, pubescent; leaf blade glossy and dark green adaxially, greenish purple abaxially, often with colored spots between veins, deltoid-rhombic to oblate-rhombic, 4–6 × 4–8 cm, abaxially pubescent, adaxially glabrous, base broadly cuneate, margin irregularly dentate distally. Petals white, 7–10 mm. Fruit turbinate to shortly rhombic, 1.8–3 × 2–4.5 × 1–2.8 cm, (0–)2–4-horned, crest a prominent bulge to a thin rib, crown tetragonal to rounded, or dome-shaped, rarely crownless, 1–8(–11) mm, beak conic or a tuft of hairs; horns horizontal, ascending, or recurved, flat-triangular or broadly conic, 2–3.5 cm, apex barbellate or cultivated without barbs. Fl. May–Oct, fr. Jul–Nov.  $2n = 44^*, 46^*, 48^*, 76^*, 90^*, ?96$ .

Slow-moving rivers, lakes, swamps, ponds, also widely cultivated in China; near sea level to 2700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Laos, Malaysia, Pakistan, Philippines, Russia, Thailand, Vietnam; Africa, SW Asia (Iran), Europe; widely cultivated in tropical and subtropical Asia; naturalized in Australia and North America].

In FRPS (53(2): 7, 9, 2000), the names *Trapa macropoda* Miki, *T. mammillifera* Miki, and *T. octotuberculata* Miki, all of which are based on fossil types, were misapplied to plants of *T. natans*.

TRAPACEAE